Name _____ Date _____
Position/Title _____
Telephone Number ( ) _____
Email address _____
Branch/Code _____
Team Name _____

Introduction and Directions:

If you don't understand a question, please leave it blank. Your SEL representative will clarify it during the interview.

While accuracy is important, please don't take a lot of time searching through personnel or other records. If you are guessing, just say so in the margin for that question. Your best estimates are probably adequate for our purposes. If you don't know an answer, just leave it blank. If a question doesn't apply to the work of your team, mark it "N/A" or write "None". Also, unless the question says otherwise, your answers should encompass both the civil servants and the contractor personnel on your team.

This questionnaire contains two parts. Part I contains high-level questions; please answer all the questions in Part I if you possibly can. Part II contains more specialized questions relating to software processes. Please answer those questions in Part II for which you have the information. Feel free to enter "Don't Know" for any questions in Part II that you cannot answer. If you can't answer any of the questions in Part II, simply put "Don't Know" at the top of Part II.

PART I. HIGH-LEVEL QUESTIONS

1. GENERAL INFORMATION

a) How many people do you have on your team? _____ FTEs

b) What organizations (e.g., your own branch, other branches, or contractor organizations) are represented on your team? How many of the people on the team come from each organization?

ORGANIZATION	NUMBER OF FTEs
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

c) Could you please indicate the different roles that the members of the team perform?

TEAM ROLE	CHECK IF REPRESENTED ON TEAM
Team Lead	_____
Sub-Team Lead	_____
Scientist	_____
Systems Analyst	_____
Requirements Engineer	_____
Mathematician	_____
Programmer	_____
Webmaster	_____
Tester	_____
Quality Assurance	_____
Configuration Management	_____

Other (please list other roles below)

_____ _____
_____ _____
_____ _____

d) What was the previous GSFC code(s) for this team or project(s)? Code(s) _____

e) Is this team part of a larger team? Yes _____ No _____

If so, please identify the larger team by its GSFC Code and team name, and indicate its size and function.

_____
_____

f) Does this team support software development or maintenance? (If neither, skip to question k.)

Development _____ Maintenance _____ Both _____ Neither _____

g) If you answered "Both" to question f, please indicate how the team's software effort is divided between development and maintenance. (The numbers should add up to 100 %).

Development _____ % Maintenance _____ %

h) What is the approximate allocation of your team's <u>software development</u> (i.e., not maintenance) effort to the following activities? *(The sum of all activities should total 100%.)*

Reqts Analysis _____% Design _____% Coding _____% Testing _____%

Qual. Ass. _____ % Conf. Mgt. _____ % Documentation _____ % Management _____ %

i) What is the approximate allocation of your team's <u>maintenance</u> effort to the following activities? *(The sum of all activities should total 100%.)*

Reqts Analysis _____% Design _____% Coding _____% Testing _____%

Qual. Ass. _____ % Conf. Mgt. _____ % Documentation _____ % Management _____ %

j) What is the approximate allocation of that <u>maintenance</u> effort to the following components:
(The sum of all activities should total 100%.)

Correcting _____ % Enhancing _____ % Adapting _____ % Testing/Verifying _____ %

k) What percent of the teamś workload is allocated to software engineering research? _____ %

2. PERSONNEL CHARACTERISTICS

a) How many years of team or project leadership experience does the team lead have?

_____ years experience

b) What skills in management practices do the team members bring to the group? If one or more of the team members has a management skill thatś not listed here, please feel free to add it.

MANAGEMENT SKILL	CHECK IF REPRESENTED ON TEAM
Project Planning	_____
Software Effort Estimation	_____
Risk Analysis	_____
Team Building	_____
Communication	_____
Organizing	_____
Tracking Work Performed	_____
Other (please list other management skills below)	
_____	_____
_____	_____

c) What software technical skills do the team members bring to the group? If one or more of the team members has a software skill thatś not listed here, please feel free to add it.

SOFTWARE SKILL	CHECK IF REPRESENTED ON TEAM
Requirements Analysis	_____
Software Size Estimation	_____
Software Design	_____
Project-Specific Languages	_____
Walkthroughs and Inspections	_____
Testing Methods	_____
Web Site Development	_____
S/W Configuration Management	_____
S/W Quality Assurance	_____
Other (please list other software technical skills below)	
_____	_____
_____	_____
_____	_____

d) How many days are spent in software related training per work-year? Please enter the total number of days per work-year, on average, for each member of the team. _____ days/work-year/team member

e) How do you plan training for the team? How do you determine what training each staff member will receive?

_____
_____
_____

3. PRODUCTS DEVELOPED AND USED

a) Do you have any metrics other than kSLOC to measure software size? Yes ____ No ____

If so, please specify these metrics. _____

[Note: kSLOCs are defined as the sum of all physical lines; i.e., executable, non-executable, and commentary.]

b) What specific software products does the team **develop**? For each product, please supply the information called for in the table below.

PRODUCT NAME	FUNCTION	SIZE (kSLOC OR OTHER METRIC)	LANGUAGE	ANTICIPATED OPERATIONAL LIFE (YEARS)	EFFORT (STAFF-YEARS)

c) What specific software products does the team **maintain**? For each product, please supply the information called for in the table below.

PRODUCT NAME	FUNCTION	SIZE (kSLOC OR OTHER METRIC)	LANGUAGE	ANTICIPATED OPERATIONAL LIFE (YEARS)	EFFORT (STAFF-YEARS)

d) What percent of your typical deliverable software products consist of embedded COTS or GOTS? _____%

e) What percent of your typical deliverable software products consist of reused code? _____%

[For this survey, "reuse" means reuse of source code only. Reused code is the sum of lines of code contained in modules which are used verbatim from another system or with very minor change; e.g., less than 10% change.]

4. HIGH-LEVEL PROCESS CHARACTERISTICS

["Software process" means the phases, activities, and products by which the software is defined, developed, documented, and delivered. Such a process would include policies and standards, formal and informal reviews, and collection, analysis, and use of metrics.]

a) What percentage of your team (including any contractors) uses defined, written, advocated software processes? _____%

b) To what extent are these software processes used? (Check one)
Minimal use ____ Some use ____ Extensive use ____

c) How helpful are the software processes? (Check one)
Minimally helpful ____ Somewhat helpful ____ Very helpful ____

d) To what degree are these software processes enforced? (Check one)
Minimally enforced ____ Somewhat enforced ____ Rigorously enforced ____

e) Where are your software processes documented, and who owns them?

_____
_____

f) What percentage of your team (including any contractors) use software standards? _____%

g) To what extent are these standards used? (Check one)
Minimal use ____ Some use ____ Extensive use ____

h) How helpful are the standards? (Check one)
Minimally helpful ____ Somewhat helpful ____ Very helpful ____

i) To what degree are these standards enforced? (Check one)
Minimally enforced ____ Somewhat enforced ____ Rigorously enforced ____

j) What standards are used in your team? List NASA or other standards (e.g., ANSI, IEEE, ISO).

_____
_____
_____

k) Where are your software standards documented, and who owns them?

_____
_____

l) Does your team use Commercial Off-the-Shelf (COTS) products as components of deliverable systems (i.e., embedded COTS)? Yes____ No____

If yes, please specify:

_____
_____
_____

m) Does your team use COTS products to support software development and maintenance (that must be delivered with a system)? Yes____ No____

If yes, please specify:

_____
_____
_____

n) Does your team use COTS products to support software development and maintenance that are **NOT** delivered with a system)? Yes____ No____

If yes, please specify:

_____
_____
_____

o) What languages is your team using for new software presently under development?
Fortran _____% Cobol ____% C____% C++ ____% Ada ____% 4GL____%
Other (specify): _____ ____%
_____ ____%
_____ ____%

p) What percent of your team's **existing** software is written in the following languages?
Fortran _____% Cobol ____% C____% C++ ____% Ada ____% 4GL____%
Other (specify): _____ ____%
_____ ____%
_____ ____%

q) Which of the following key project documents does your team generally produce?

PROJECT DOCUMENT	CHECK IF NORMALLY PRODUCED
Project Plan	_____
Requirements Specification	_____
Design Document	_____
Test Plan	_____
Quality Assurance Plan	_____
Configuration Management Plan	_____
User's Guide	_____

Other (please list other project documents below)

_____ _____
_____ _____

r) What are the major testing techniques used in your team?

_____
_____
_____

Are forms used to record test results?	Yes____	No____
Is there training for testing?	Yes____	No____
Is data archived?	Yes____	No____

s) What types of tools are routinely applied by your team? (Use checkmarks)

Requirements Analysis	_____	*Traceability*	_____	*Design/Graphics*	_____
Documentation	_____	*Debuggers*	_____	*Test Data Generators*	_____
Test Coverage	_____	*QA Checkers*	_____	*CM Aids*	_____
Complexity Measuring	_____				

Other Types (please list): _____

t) What are the characteristics of your software development environment?

Development platform: Hardware _____ Operating System _____

Target platform: Hardware _____ Operating System _____

PART II. DETAILED INFORMATION ON SOFTWARE AND MANAGEMENT PROCESSES

[If you dont have any information for the questions in Part II, please check here: _____]

5. DETAILED SOFTWARE PROCESS CHARACTERISTICS

a) When changes are made to completed software units, are the following practices employed?

	<10%	*10-25%*	*25-50%*	*>50% of the time*
Change Request Form	____	____	____	____
Formal Impact Assessed?	____	____	____	____
Change Control Board?	____	____	____	____
Documents Updated?	____	____	____	____
Metrics Collected?	____	____	____	____
Regression Testing?	____	____	____	____

b) What is the knowledge and usage in your team of the following:

	---- Awareness ----			*---- Training ----*			*---- Usage ----*		
	Minimal	*Some*	*Much*	*Minimal*	*Some*	*Much*	*Minimal*	*Some*	*Much*
Prototyping	____	____	____	____	____	____	____	____	____
Object-Oriented Methods	____	____	____	____	____	____	____	____	____
Inspections/Walkthroughs	____	____	____	____	____	____	____	____	____
Cleanroom Techniques	____	____	____	____	____	____	____	____	____
Formal Methods	____	____	____	____	____	____	____	____	____
CASE Tools	____	____	____	____	____	____	____	____	____
Structured Analysis	____	____	____	____	____	____	____	____	____
Information Hiding	____	____	____	____	____	____	____	____	____
COTS Integration	____	____	____	____	____	____	____	____	____
Other _____	____	____	____	____	____	____	____	____	____

c) Please indicate the types of software metrics used in your team. *[Software "measures" and software "metrics" are interchangeable terms.]* **Possible answers are: 1) Never, 2) Sometimes, or 3) Routinely.**

Type	Data Collected?	Analyzed?	Feedback to Team?	Archived in a Database?
Resource (effort, computer use...)	_____	_____	_____	_____
Defects (errors and their causes...)	_____	_____	_____	_____
Product (code size, pages of documentation...)	_____	_____	_____	_____
Process (extent of training, records of reviews...)	_____	_____	_____	_____
Productivity (Volume of work per unit of time, SLOC per staff years	_____	_____	_____	_____
Project characteristics (language, platform)	_____	_____	_____	_____
Modifications (effort, reason, application domain, team experience.)	_____	_____	_____	_____

d) What is the typical productivity of your group (delivered kSLOCs per hour)?

_____

e) List the software measures that are collected by your team, and indicate how each measure is captured (e.g., from inspection checklists, reported by inspection moderators, reported by each programmer, etc.).

_____ _____
_____ _____
_____ _____

f) List the estimates (e.g., cost, schedule, software size, performance) that are used within the team, and state the raw data from which each estimate is derived (e.g., requirements, SLOC, comparison with a previous system, prototype).

_____ _____
_____ _____
_____ _____

g) List any mathematical models (e.g., system performance, software size, cost, schedule, or work flow) that the team regularly employs, and indicate how each model is used.

_____ _____
_____ _____
_____ _____

h) Which of the following software life cycle models does your team generally employ?

SOFTWARE LIFE CYCLE MODEL	CHECK IF NORMALLY EMPLOYED
Waterfall	_____
Modified Waterfall *	_____
Evolutionary Prototyping	_____
Incremental Development	_____
Evolutionary Development	_____
Package-Based Development	_____
Legacy System Maintenance	_____
Spiral	_____

Other (please list other software life cycle models below)

_____ _____
_____ _____

* Examples of modified waterfall SLCMs are waterfall with overlapping phases and waterfall with parallel subprojects.

i) Which (if any) of the following types of reviews does the team use?

	Used? (Yes/No)
Formal project reviews	_____
In-process reviews	_____
Walkthroughs	_____
Inspections	_____
Process audits	_____
Quality audits	_____
Management audits	_____

j) If you indicated in Question i that you use formal project reviews, please indicate which specific formal reviews are typically held.

	Used? (Yes/No)
System Requirements Review	_____
Preliminary Design Review	_____
Critical Design Review	_____
Functional Conf. Audit	_____
Physical Conf. Audit	_____
Operational Readiness Review	_____

Other (please list other formal reviews below)

_____ _____
_____ _____

6. PRODUCT CHARACTERISTICS

a) What is the typical defect density (e.g. number of defects per kSLOC) in your delivered or operational software?

	Number of Errors/kSLOC
Minimum Defect Density	_____
Average Defect Density	_____
Maximum Defect Density	_____

[NOTE: kSLOCs are defined as the sum of all physical lines, i.e., executable, non-executable, and commentary. If you use another definition of kSLOCs (for example, executable lines only), or if you normally use a measure other than kSLOC, please provide this information here.
_____]

b) What are typical causes of errors in your team's operational software?
(Please rank most to least significant, 1 = most significant)

Misinterpreted Requirements	_____
Changing Requirements	_____
Missing Requirements	_____
Design Errors	_____
Interfaces	_____
Coding Errors	_____
Environment Problems	_____

c) What is the most costly type of error to fix? _____

d) Typically, how stable are the software requirements that your team receives?

Very stable _____ Fairly stable _____ Unstable _____

7. MANAGEMENT CHARACTERISTICS

a) What types of project risks do you typically encounter?

	Encountered? (Yes/No)
Technical risks	_____
Schedule risks	_____
Cost risks	_____
Performance risks	_____
Quality risks	_____
Operability risks	_____

Other (please list other types of risks encountered below)

_____ _____
_____ _____

b) What types of risk mitigation techniques do you employ?

_____
_____
_____

c) Are Project Plans typically used by the project(s) your team supports? Yes _____ No _____
[Note: "Project Plans" include Management and/or Development Plans.]

(check the one that applies)
Kept Current & Followed ____ Followed but NOT Maintained ____ NOT Followed NOR Maintained ____

e) What is the project schedule, by project activity? Please include both software and non-software tasks.

PROJECT ACTIVITY	PER CENT
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

f) What is the approximate allocation of your project's total schedule to the following software activities? *(The sum of all activities should total 100%.)*

Reqts Analysis _____% Design _____% Coding _____% Testing _____% Other _____ %